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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/629,337	08/01/2000	Mark C. Fowler	0100.0001160	7287

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EXAMINER	
BRIER, JEFFERY A	
ART UNIT	PAPER NUMBER
2628	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 09/629,337	Applicant(s) FOWLER ET AL.	
	Examiner Jeffery A. Brier	Art Unit 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/17/2006 has been entered.

Response to Amendment

2. The amendment filed on 7/17/2006 has been entered. The information disclosure statement refilled on 7/17/2006 has been considered. The amendments to figure 3 overcome the objection to the drawings. The amendment to page 8 line 17 overcomes the objection to XFER but the amendment to page 8 does not overcome the objection to page 8 lines 4, 6, and 17 and page 11 at lines 8 and 10 because the amendment does not clarify XDIR and YDIR. The amendment correlates XDIR with a logical NOT DIR, however, the amendment does not clearly refer to both XDIR and YDIR.

Response to Arguments

3. Applicant's arguments filed 7/17/2006 have been fully considered but they are not persuasive because Watanabe at paragraph 0114 discusses the detailed clipping stage S24 as "only the view objects included in the view volume are selected from those selected in S22 by known techniques. Thus, Watanabe similar to applicant has built upon that which was practiced in the art and modified it so as to select only the objects within the view volume. The article submitted by applicant "A Parallel Algorithm for Polygon Rasterization" teaches on page 19 section 5 only filling in the pixels within the clipping region even though the primitive extends beyond the clipping region. Thus, applicant arguments are not persuasive. The previous rejection is maintained and modified below to include the article.

Specification

4. The disclosure is objected to because of the following informalities:
page 8 at lines 4, 6, and 17 and page 11 at lines 8 and 10 discuss XDIR and YDIR but do not describe the difference between XDIR and XDIR as well as the difference between YDIR and YDIR. Similar note should be made of claims 6, 13, 14, 15, and 18 in contrast with claims 3 and 4; and

At page 4 line 18 "determined" should be "determine".

Appropriate correction is required.

Claim Objections

5. Claims 3 and 4 are objected to because of the following informalities:

Claim 3 in the last four lines the second XDIR and YDIR should have underlining, see page 8 and claims 13 and 18; and

Claim 4 in the last four lines the second XDIR and YDIR should have underlining, see page 11 and claims 6, 15, and 18. However, if claim 4 is amended then it will be identical to claim 6 which will cause claim 6 add either a redundant step or fail to further limit the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims do not claim a useful, concrete, and tangible result. These claims are directed to filling only pixels in the portion of the primitive that is inside the screen region which is an abstract entity. *State Street Bank & Trust Co. v. Signature Financial Group Inc.* (CA FC) 47 USPQ2d 1596, 1603 (7/23/1998). *AT&T Corp. v. Excel Communications Inc.* (CA FC) 50 USPQ2d 1447. On page 1603 first paragraph the CAFC wrote in *State Street*:

On page 1603 first paragraph the CAFC wrote in State Street:

Under *Benson*, this may have been a sufficient indicium of nonstatutory subject matter. However, after *Diehr* and *Alappat*, the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a "useful, concrete and tangible result." *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557. 7

On page 1603 paragraph labeled [4] the CAFC wrote:

[4] The question of whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to -- process, machine, manufacture, or composition of matter-- but rather on the essential characteristics of the subject matter, in particular, its practical utility. Section 101 specifies that statutory subject matter must also satisfy the other "conditions and requirements" of Title 35, including novelty, nonobviousness, and adequacy of disclosure and notice. See *In re Warmerdam*, 33 F.3d 1354, 1359, 31 USPQ2d 1754, 1757-58 (Fed. Cir. 1994).

Filling pixels of claims 1 and 20 or supplying filled pixels of claims 10 and 18 are abstract entities unlike the anti-aliased pixel illumination intensity data to be displayed on a display means of *In re Alappat*, 31 USPQ2d 1545, 1555, 1557 (Fed. Cir. 1994) and unlike the dollar amounts of *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 USPQ2d 1596, 1601 (Fed. Cir. 1998) and the unlike the condition of a patient's heart of *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 22 USPQ2d 1033 (Fed. Cir. 1992). *Alappat* discussed claim 15 at page 1555 and discussed their rationale at page 1557. *State Street* discussed the dollar amounts rationale at page

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1601. Additionally at page 1599 State Street construed the means of the claims at elements d, e, f, and g to include storing of calculated values and this storing was not used in the analysis of the claim in determining the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

Alappat's claim 15 discussion:

When independent claim 15 is construed in accordance with Section 112 Para. 6, claim 15 reads as follows, the subject matter in brackets representing the structure which Alappat discloses in his specification as corresponding to the respective means language recited in the claims:

A rasterizer [a "machine"] for converting vector list data representing sample magnitudes of an input waveform into anti- aliased pixel illumination intensity data to be displayed on a display means comprising:

- (a) [an arithmetic logic circuit configured to perform an absolute value function, or an equivalent thereof] for determining the vertical distance between the endpoints of each of the vectors in the data list;
- (b) [an arithmetic logic circuit configured to perform an absolute value function, or an equivalent thereof] for determining the elevation of a row of pixels that is spanned by the vector;
- (c) [a pair of barrel shifters , or equivalents thereof] for normalizing the vertical distance and elevation; and
- (d) [a read only memory (ROM) containing illumination intensity data, or an equivalent thereof] for outputting illumination intensity data as a predetermined function of the normalized vertical distance and elevation.

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Alappat's rationale discussion at page 1557:

(b)

Given the foregoing, the proper inquiry in dealing with the so called mathematical subject matter exception to Section 101 alleged herein is to see whether the claimed subject matter as a whole is a disembodied mathematical concept, whether categorized as a mathematical formula, mathematical equation, mathematical algorithm, or the like, which in essence represents nothing more than a "law of nature," "natural phenomenon," or "abstract idea." If so, Diehr precludes the patenting of that subject matter. That is not the case here. Although many, or arguably even all, ²² of the means elements recited in claim 15 represent circuitry elements that perform mathematical calculations, which is essentially true of all digital electrical circuits, the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means. ²³ This is not a disembodied mathematical concept which may be characterized as an "abstract idea," but rather a specific machine to produce a useful, concrete, and tangible result.

State Street's rationale discussion at page 1601:

Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

Thus, in this application the claims do not produce a useful, concrete, and tangible result.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3, 7-12, 16-17 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (5,040,130) in view of Watanabe et al (US 2001/0013867) and in view of the article by Pineda titled "A Parallel Algorithm for Polygon Rasterization".

Regarding claims 1-2, 9 and 20 Chang et al discloses that the claimed feature of a method for rasterizing primitives, comprising the steps of: determining if a primitive is totally outside [i.e. Fig 4C] a predetermined screen region [i.e. "clipping window" 42, 152 in visible side of Figs 3,7A] or at least partially [i.e. Fig 3A, Fig 4B, Fig 4D, Fig 7A] within the predetermined screen region, discarding the primitive if the primitive [i.e. edge 52c in Fig 4C] is totally outside the screen region [i.e. "visible side"] ("both vertex P1,P2 are dropped, neither is preserved for display", See col 6 line 24-28), finding at least a portion of the primitive [i.e. Fig 3A, Fig 4B, Fig 4D, Fig 7A] that is inside the screen region if the primitive is not totally outside the screen region, filling ["area fill processor"; 29] only pixels in the portion of the primitive that is inside the screen region, when a start vertex for edgewalking the primitive is outside of the screen region [i.e. invisible side], then starting edgewalking with the start vertex and proceeding to an intersection

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point [i.e. P8', P3', P4', P7' in Fig 3] with the screen region [42] the primitive [40] at which time only the portion of the primitive that is inside ["visible side"] the screen region is filled, wherein if the start vertex of the primitive is inside of the screen region, then filling only pixels in the portion of the primitive that is inside the screen region (See col 17 line 31-35; also see Fig 3, Fig 7, Fig 10-12, Abstract, col 3 line 14-27, col 9 line 60-col 10 line 18, col 17 line 59-65, claims 12 and 17), repeating the method steps for each primitive of a plurality of primitives ("repeating the above steps until all edges of the boundary-defined area are processed", See col 3 line 17-19, Also See "repeating steps" in claims), and the primitive is a triangle [i.e. Fig 11]

Chang et al does not specifically disclose that "filling only pixels in the portion of the primitive that is inside the screen region."

However, such limitation is shown in the teaching of Watanabe et al. (See Fig 1, Fig 2, Fig 9, [8]) [i.e. rasterizing objects [S10] after clipping [S24], See paragraph 0114.

The Pineda article titled "A Parallel Algorithm for Polygon Rasterization" teaches on page 19 section 5 only filling in the pixels within the clipping region even though the primitive extends beyond the clipping region.

It would have been obvious to one skilled in the art to incorporate the teaching of Watanabe et al and Pineda into the teaching of Chang et al, in order to eliminate the unnecessary time of pixel filling process [i.e. rasterization] for the portion of primitives, where it will not be rendered in final image, as such improvement is also advantageously desirable in the teaching of Chang et al for saving total processing time with maximum efficiency.

Regarding claims 10-12 and 16-17, claims 10-12 and 16-17 are similar in scope to the claims 1-2 and 9, and thus the rejections to claims 1-2 and 9 hereinabove are also applicable to claims 10-12 and 16-17.

Regarding claim 3, Chang et al discloses that using X,Y coordinate system; and determining values of XSTART,YSTART,XEND,YEND for the primitive, Providing values of XLEFT,XRIGHT,YTOP,YBOTTOM for the screen region; and comparing the primitive values to the screen region values to determine if the primitive is totally outside the screen region. (See Fig 3a-3c, Fig 4a-4d, Fig 5, Fig 7a, Fig 8a, Fig 9a) ["a method for clipping a line segment boundary defined area [primitives] against a limiting plane [screen region] using the coordinate values of viewing region [42,152] and a primitive [40,150]"]

Regarding claim 7, Change et al further discloses that the steps of: defining a start point on an edge of the primitive; determining if the start point is outside the screen region; edge walking the edge of the primitive from the start point to a boundary of the screen region; span walking a portion of the primitive inside the screen region and filling each pixel in the portion of the primitive that is inside the screen region. (See Fig 3a-3c, Fig 4a-4d, Fig 5, Fig 7a, Fig 8a, Fig 9a)

Regarding claim 8, Chang et al discloses that the primitive is a triangle and the start point is a vertex of the triangle. (See Fig 11)

Regarding claim 21, Chang et al discloses that filling only pixels in the portion of the primitive that is inside the screen region ends when all pixels within the portion of the primitive inside the screen region have been filled. (See Fig 3)

Allowable Subject Matter

10. Claims 4-6 and 13-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 101 set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claims 18 and 19 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101 set forth in this Office action.

Claim 4:

The prior art of record fails to teach or suggest this claim in the context of the parent claims.

Claim 13:

The prior art of record fails to teach or suggest this claim in the context of the parent claims.


Claim 18:

The prior art of record fails to teach or suggest the claimed primitive locator module, edge walker module, and span walker module in the context of the claims as a whole.

The closest prior art, Chang et al (5,040,130) discloses similar image processing system, either singularly or in combination, fail to anticipate or render the above limitations obvious.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A Brier whose telephone number is (571) 272-7656. The examiner can normally be reached on M-F from 7:00 to 3:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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